Grandiose delusions: A review and theoretical integration of cognitive and affective perspectives

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ABSTRACT

Grandiose delusions (GDs) are found across a wide range of psychiatric conditions, including in around two-thirds of patients diagnosed with bipolar disorder, half of patients diagnosed with schizophrenia, as well as in a substantial proportion of patients with substance abuse disorders. In addition, over 10% of the healthy general population experience grandiose thoughts that do not meet full delusional criteria. Yet in contrast to other psychotic phenomena, such as auditory hallucinations and persecutory delusions, GDs have received little attention from researchers. This paper offers a comprehensive examination of the existing cognitive and affective literature on GDs, including consideration of the evidence in support of ‘delusion-as-defence’ and emotion-consistent models. We then propose a tentative model of GDs informed by a synthesis of the available evidence designed to be a stimulus to future research in this area. As GDs are considered to be relatively resistant to traditional cognitive behavioural techniques, we then discuss the implications of our model for how CBT may be modified to address these beliefs. Directions for future research are also highlighted.

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1. Introduction

Recent approaches to psychopathology have shifted away from a diagnostically driven approach towards a focus on transdiagnostic efforts to understand individual symptoms and processes (Bentall, 2006). Dedicated cognitive models have been developed for many of the experiences typically associated with psychosis, such as auditory hallucinations (e.g., Beck & Rector, 2005; Bentall, 1990; Horowitz, 1975) and persecutory delusions (e.g., Bentall, Corcoran, Howard, Blackwood, & Kinderman, 2001; Freeman, Garety, Kuipers, Fowler, & Bebbington, 2002), including integrative frameworks that seek to account for the positive symptoms of psychosis together (e.g., Garety, Kuipers, Fowler, Freeman & Bebbington, 2001; Morrison, 2001). Grandiose delusions (GDs), by contrast, have received relatively little theoretical or empirical attention. Indeed, one of the few recent studies to have addressed these experiences directly concluded that “much remains to be determined in understanding the formation and maintenance of grandiose delusions” (Smith, Freeman, & Kuipers, 2005, p. 486).

Achieving a better understanding of the onset and maintenance of GDs is likely to be beneficial for a number of reasons. Models of persecutory delusions have informed the development of focused cognitive behavioural interventions (Freeman & Garety, 2006), and similarly tailored interventions for GDs are likely to be useful. It has also been suggested that GDs may play a role in the development of persecutory delusions (Lake, 2008) and a better understanding of GDs may thus contribute to the development of more effective interventions for persecutory delusions. The present paper aims to review the existing literature on the psychological mechanisms underpinning GDs and to propose an integrated conceptualization of this phenomenon that is amenable to empirical testing. In particular, we aim to summarize epidemiological findings, to evaluate the evidence for delusion-as-defense and emotion-consistent accounts, and to consider the role of cognitive biases in the development and maintenance of GDs. The present review is hence restricted to a consideration of cognitive and affective factors. Whilst there is a clear need for a review of genetic, neurobiological and neuropsychological perspectives on GDs, this is beyond the scope of the present review.

This review is informed by a systematic search of MEDLINE (1950–May 2010), PsychInfo (1967–2010) and Scopus (1823–May 2010) databases for peer-reviewed articles on grandiose delusions published in English. The search string employed was “(grandeur* OR grandi*) AND (delus* OR belief)”. Each result was examined first by inspection of the title, and then, as required, the abstract and the full text. Studies were excluded if they focused exclusively on grandiosity in the context of personality disorders (e.g., Narcissistic Personality Disorder). The reference sections and citation reports of papers identified by this search were examined to identify further relevant papers. The criterion for the inclusion of studies for the purposes of prevalence estimates of GDs was a sample size in excess of 50 participants, and for studies of psychiatric patients, that they be published after the publication of DSM-III-R in 1994 in order to achieve some measure of diagnostic comparability.

2. What are grandiose delusions?

GDs are defined as false beliefs about having inflated worth, power, knowledge or a special identity which are firmly sustained despite undeniable evidence to the contrary (APA, 2000). Some examples are given in Table 1. GDs, like other delusional beliefs, are multidimensional (Garety & Hemsley, 1994), varying with regard to the degree of conviction and preoccupation, and the levels of distress and dysfunction caused. GDs (alongside religious delusions) seem to be held with the greatest conviction and tend to be associated with less negative affect than other delusions (Appelbaum, Robbins, & Roth, 1999). However, an apparent paradox given this increased degree of conviction is Appelbaum and colleagues’ report that GDs are less likely to motivate individuals to act than other types of delusions. This finding is somewhat counterintuitive in the light of clinical observations of patients engaging in risky and impulsive behaviour fuelled by grandiose delusional beliefs. Appelbaum et al.’s (1999) finding may be a measurement artefact, since the ‘action’ dimension of the MacArthur–Maudsley Delusions Assessment Schedule is biased towards the assessment of aggressive acts, meaning that respondents would achieve low scores for not acting on their beliefs in an aggressive or violent manner regardless of other behavioural consequences. Because of their nature and content, we would not expect the behaviours motivated by GDs to be of an aggressive or violent nature, and so this assessment tool may be inadequate for the purposes of establishing links between GDs and any associated behaviour.

### 3. The epidemiology of grandiose delusions and beliefs

#### 3.1. Prevalence of clinically relevant grandiose delusions

GDs are among the most commonly encountered delusional beliefs. In a study of 1,136 consecutively admitted psychiatric patients, Appelbaum et al. (1999) found that 43% of the 328 patients who presented with delusional beliefs reported GDs. Only persecutory delusions (78%) and delusions of body/mind control (60%) were more commonly observed. Table 2 lists the studies that have reported on the prevalence of GDs in large (N>50) psychiatric samples since the publication of DSM-III-R in 1994. Clear prevalence estimates are hard to establish since a wide range of self-report and clinician-rated instruments with differing thresholds and cut-offs have been employed. Prevalence comparisons are also made harder by the use of both lifetime prevalence and point prevalence figures (usually at hospital admission), with some studies failing to report which of these two methods was used.

The issue of whether patients are able to reliably report on their own delusional beliefs is a further consideration. The absence of an objective marker of delusional beliefs means that we are reliant on patients’ descriptions and clinicians’ interpretations of these phenomena, and a recent article by Lincoln, Ziegler, Lüllmann, Müller, and Rief (2010) suggests that patients with schizophrenia spectrum disorders are reliably able to provide information about the presence and type of their delusional beliefs.
In the only study to have examined the transdiagnostic prevalence of GDs, Appelbaum et al. (1999) found that they were more frequent in bipolar disorder (59%) than in schizophrenia (49%), substance misuse disorders (30%) or depression (21%), although the statistical status of these differences was not reported. Consistent with this pattern, an earlier study by Junginger, Barker, and Coe (1992) found significantly fewer patients with schizophrenia (19%) than with affective disorders (37%) presenting with GDs, although the failure to apply a Bonferroni correction to the correlational analysis may have yielded a false positive result. The findings of the other studies in Table 2 are broadly in line with Appelbaum et al. (1999), with approximately two-thirds of patients with a diagnosis of bipolar disorder and around half of patients with a diagnosis of schizophrenia reporting GDs. Two studies, however, report much lower prevalence rates. Baethge, Baldessarini, Freudenthal, Streeruwitz, Bauer and Bschor (2005) observed GDs in just 9% of patients diagnosed with bipolar disorder, perhaps due to the use of point prevalence in a study in which only 26% of patients presented with any form of delusion. Breier and Berg (1999) also found a GD prevalence of only 9% in a schizophrenia sample, which appears to result from the conservative diagnostic criteria employed.

3.2. Demographic variables, culture and grandiose delusions

There is some preliminary evidence of a relationship between age of onset of bipolar disorder and the occurrence of GDs. Carlson, Bromet, and Sievers (2000) identified GDs in 74% of patients with early-onset (<21 years) bipolar disorder, but in just 40% of those who were aged 30 years or over at the time of their first episode, representing a statistically significant difference. There is no evidence that rates of GDs differ between men and women (de Portugal, González, Haro, Usall, & Cervilla, 2010), although it is interesting to note that the particular content of GDs may vary according to gender (Rudalevičienė, Stompe, Narbekovas, Raškauskienė, & Bunevičius, 2008).

In a study of over 1000 individuals with a diagnosis of schizophrenia from socioculturally diverse countries, grandiosity was found to be the second most common delusional theme behind persecutory delusions (Stompe, Karakula, Rudalevičienė, Okribelashvili, Chaudhry, Idemudia et al., 2006). Stompe and colleagues also found that the prevalence of GDs had remained broadly similar (38–44%) in Austrian patients over the past 145 years despite the extensive societal changes during this period. So GDs are evident across cultures, but there appears to be some cross-cultural variation in the specific presentation (Suhail & Cochran, 2002). Several studies have compared GDs between European and Asian patients. Stompe, Bau2, Karakula, Rudalevičienė, Okribelashvili, Chaudhry et al. (2007) reported significantly higher frequencies of GDs in patients with schizophrenia in Austria than in Pakistan, and they also found that delusional grandiosity with a religious theme was especially rare in Pakistan (2007). In contrast, when Suhail (2003) compared the delusional beliefs of three groups of patients diagnosed with schizophrenia – a White British group living in Britain, a group of Pakistani people living in Britain, and a third group of Pakistani people resident in Pakistan – they found that the groups did not differ in the frequencies of GDs. In fact, in this study, Pakistani people living in Pakistan were more likely to have a delusion about being a star/hero/famous person (32%) compared to the other cultural/ethnic groups (< 10%). The authors speculate that the large socio-economic disparities in Pakistan and the difficulty in achieving upward social mobility may fuel delusional beliefs about self-worth and achievements – a sort of self-defensive strategy.

There are also variations in the occurrence of GDs between ethnic groups living in the same country. Yamada et al. (2006) studied patients with psychotic disorders in the USA and found a greater prevalence of grandiose content in the delusions of European-American patients (45%) compared to African-American (35%) and Latino (25%) patients. Yamada and colleagues attempted to explain this pattern of findings as being due to the “individualistic orientation associated with an emphasis on uniqueness often associated with the Euro-American culture”, whereas grandiosity might be “culturally dystonic with the socio-centric values of the Latino culture” (p. 165). It therefore appears that cultural factors may influence the prevalence and manifestation of GDs, although precise causal mechanisms are unclear.

3.4. Prevalence of grandiose delusion-like beliefs

Grandiose beliefs which fail to meet full delusional criteria are found in the general population. Indeed, as is the case for several other psychotic phenomena (e.g., Johns & van Os, 2001), grandiose ideation appears to exist on a continuum ranging from full-blown delusions (held with conviction, resistant to change and causing significant social and occupational impairment) to more transient grandiose thoughts at the other end of the spectrum. The most commonly used tool to assess the presence of grandiose beliefs is the short-form version of the Peters
Delusion Inventory (PDI-21: Peters, Joseph, Day, & Garety, 2004). Scores on these items from non-clinical populations are shown in Table 3.

It can be seen from Table 3 that rates of endorsement of grandiose beliefs are higher in student samples than in the general population. Given that general population samples have a significantly higher mean age than student samples, this difference may be explained by the finding of Verdoux, van Os, Maurice-Tison, Gay, Salomon and Bourgeois (1998) who reported a negative correlation between age and scores on the grandiose subscale of the PDI-21. This would also be consistent with Carlson et al.’s (2000) finding of a greater prevalence of GDs in early-onset bipolar disorder. This pattern may be driven by the feelings of uniqueness and indestructibility (Elkind, 1967) that have been found to peak in adolescence (Enright, Shukla, & Lapsley, 1980).

3.5. Diagnostic specificity of grandiose delusions

There have been no direct attempts to establish whether GDs in bipolar disorder and schizophrenia share a common aetiology and phenomenology. One factor that may distinguish between GDs in the psychotic and in the affective disorders is the widely-held but poorly-evidenced assumption that GDs are mood-incongruent in the former, and mood-congruent in the latter. If true, this could be taken to suggest that GDs occurring in patients diagnosed with bipolar disorder and schizophrenia, respectively, may have different phenomenologies, aetiologies, and affective/cognitive/behavioural antecedents, and thus require separate maintenance models. Junginger et al.’s (2000) analysis of 713 participants’ beliefs. Several factor analytic studies also show an association between GDs and PDs. Bedford & Deary’s (2006) analysis of 713 participants’ delusional symptoms found that grandiosity formed a distinct factor which correlated significantly with a separate persecutory beliefs factor. Other factor analytic studies have concluded that GDs and PDs are at least partially independent from one another (e.g., Kitamura, Okazaki, Fujinawa, Takayanagi, & Kasahara, 1998) and that PDs and GDs have some non-shared causes (Freeman, 2007), although what these might be remains poorly understood.

5. Affect and grandiose delusions

Contemporary psychological models of GDs reject Berrios’s (1991) claim that delusions are meaningless speech acts and propose instead that GDs are related to past/current emotional concerns. One family of models suggests that GDs arise from an individual’s attempt to defend themselves against negative affective states, which Freeman, Garety,
Fowler, Kuipers, Dunn, Bebbington et al. (1998) call “delusion-as-defense” (DAD) accounts. A second group of models termed “emotion-consistent” proposes that GDs emerge out of current positive affective states (Smith et al., 2005, p. 486).

5.1. Affect in “delusion as defence” models of GDs

Beck and Rector (2005) have argued that GDs “may develop as a compensation for an underlying sense of loneliness, unworthiness, or powerlessness” (p. 588) and note from their clinical experience that many patients with GDs “have experienced prior life crises characterized by a sense of failure or worthlessness” (p. 588). There is some preliminary evidence that early traumatic life-events may be associated with GDs (Read, Agar, Argyle, & Aderhold, 2003) but in a sample of patients with psychosis, Mason, Brett, Collinge, Curr, and Rhodes (2009) only detected a trend towards an association between grandiose beliefs and a composite measure of childhood trauma. Neale’s (1998) manic defense hypothesis – by which grandiose beliefs (with other symptoms of mania) serve the function of keeping distressing thoughts out of consciousness – is similar to Beck and Rector’s (2005) argument. Some preliminary evidence in support of the hypothesis that GDs may be understood to compensate for failure/dissatisfaction with life can be found in qualitative study of delusional patients, which concluded that “a link can be made between delusional themes and themes from personal goals” (Rhodes & Jakes, 2000, p.221).

While the qualitative evidence is limited by the small number of studies, there is a greater volume of quantitative research in this area. This body of work arose from the success of a paradigm for testing a studies, there is a greater volume of quantitative research in this area. Bentall, 1994) although results are mixed (e.g.,Martin & Penn, 2002).

Furthermore, since social rank theory predicts that shame and outsider status is associated with social anxiety (Gilbert & Trower, 2001) we might also expect these features to be associated with GDs. Given that only one study has directly examined the relationship between GDs and implicit/explicit self-esteem discrepancies, it is important to consider other potential sources of evidence. Explicit self-esteem has been found to exceed implicit self-esteem in currently manic and remitted patients (Lyon et al., 1999) and in an analogue study of hypomania (Bentall & Thompson, 1990). Bentall, Kinderman, and Manson (2005) examined self-discrepancies in manic, depressed and remitted bipolar patients as well as a group of healthy controls. They found that manic patients rated their actual self as being closer to their ideal self than any of the other groups, why they interpreted as being consistent with the proposal that a defense was operational in the manic state to prevent the negative affective consequences of actual-ideal self-discrepancies.

5.2. Affect in emotion-consistent models of grandiose delusions

An alternative to the DAD pathway is the suggestion that delusional beliefs arise from current concerns (Freeman et al., 2002), referred to as an “emotion-consistent” account (Smith et al., 2005, p. 486). This model suggests that grandiose beliefs are built on existing or endorsed beliefs (Smith et al., 2005, p. 481). These positive beliefs about the self may become exaggerated against the backdrop of the positive affective state, and may be uncritically accepted due to cognitive and information processing biases (see Section 7.1). The positive affective state may also be amplified by other processes such as the occurrence of mood-congruent mental imagery (see Section 7.3). Smith et al. (2006) have further proposed that a combination of elevated mood and positive views of the self alongside
negative evaluations of others may promote a social position that sustains positive self-beliefs and a rejection of social cues, which could in turn maintain GDs.

The limited available evidence is broadly in support of this emotion-consistent model. Two separate clinical studies have reported that levels of grandiose beliefs were correlated with higher explicit self-esteem and lower depression scores (Moritz et al., 2010; Smith et al., 2006). Smith and colleagues suggested that individuals with GDs tend to make negative evaluations of others in order to “foster a social position that maintains positive self-evaluations” (p. 183). Although there was no correlation between negative evaluations of others and levels of GDs, a logistic regression showed that both low depression scores and negative beliefs about others were independently associated with GDs (Smith et al., 2006). An analogue study also found that levels of grandiose beliefs were predicted by positive (but not negative) views of the self (Fowler et al., 2006). None of these studies is able to establish the potential direction of causation in the relationship between explicit self-esteem and grandiose beliefs: higher explicit self-esteem may facilitate the development of mood-congruent grandiose beliefs, but a DAD interpretation of these findings could be that grandiose beliefs arise as a defense against low self-esteem, resulting in increased positive self-esteem. Raune et al.’s (2005) study which found fewer negative loss events in the recent history of those individuals with GDs offers some basis for favouring the emotion-consistent interpretation of the results, although the (limited) evidence discussed in Section 5.1 linking trauma and GDs leaves this question open. We note that at least one of the predictions of an emotion-consistent account appears to be borne out by empirical research. Given that feelings of uniqueness, indestructibility and heroiness peak in adolescence, the emotion-consistent model would predict a higher incidence of GDs in younger adults than in older people—a pattern that has been observed. Lake (2008) has argued for a key role of positive mood in the aetiology of GDs, and interestingly, the clinical vignettes in his study appear to support a relatively underdeveloped facet of the emotion-consistent account of GDs. Freeman and Garety (2003) suggest that GDs may build on “pre-existing inflated, or accurate, perceptions of the self” (p. 938, italics added), and Smith et al. (2005, p.481) note that GDs may build on “existing or preserved raised areas of self-esteem”. This is consistent with Lake’s examples of the chemistry graduate who believed that he possessed a formula to make synthetic narcotics, and the patient with a background in rocket engineering who believed that he had a Star Wars missile design. Lake describes these beliefs as building on a “thread of truth” (p. 1153).

GDs can be very specific beliefs related to particular areas of positive self-esteem expertise or achievement. However, as is clear from Table 1, they may also be much broader and less grounded in reality, and the differences between the two types of beliefs is unclear. It may be that if an individual does not have a clear current/past strength on which to draw, then a GD may involve global self-esteem being elevated. Alternatively, it may be that broad GDs start off as more specific beliefs that escalate and expand due to the effects of various cognitive mechanisms as discussed in Section 7.

In conclusion, the current empirical evidence appears to offer more support for an emotion–consistent account of GDs than for a DAD model, although a series of clinical vignettes and the one qualitative study in this area suggest the DAD model may also be applicable, highlighting the need for further longitudinal research into the onset and development of GDs.

6. Anomalous experiences, their appraisal, and GDs

Psychological models of delusional ideation typically argue that the search for meaning following an initial anomalous experience leads to the emergence of a delusional explanation (Maher, 1988), and an account of this type may be applicable to GDs. One candidate for the initial anomalous trigger experience is an individual’s internal state. Mansell, Morrison, Reid, Lowens, and Tai (2007) have argued that a range of mental disorders may be characterized by intrusions into awareness of information (in the form of body state information, affect, thoughts and images or external sensory input, for example) which is appraised in an unusual manner. Mansell et al. (2007) further note that the particular appraisal made about an intrusion is influenced by existing beliefs resulting from individual life experiences. Mansell and colleagues have applied this idea primarily to the emergence of manic mood states, but it may also be relevant to the development of GDs.

An example of the problematic appraisal in action may look something like this. An initial event (e.g., an exciting life event, or stimulant use) leads to a more positive mood, greater physiological arousal, or altered cognition. This experience is interpreted by an attribution of extreme personal meaning, rather than an external or situational attribution (Mansell et al., 2007). For example, experiencing one’s rate of thinking as being increased might be interpreted as a sign of great intelligence, wit and intuition (a personal attribution), or it could be interpreted as a consequence of managing too many competing tasks (a situational attribution) (Mansell et al., 2007; Jones, Mansell, & Waller, 2006). Similarly, an individual who suddenly feels alert, active and finds they have a reduced need for sleep may make sense of this sensation by assuming that it is due to dispositional characteristics such as their underlying dynamism or ability as opposed to being the result of excessive stimulation from the environment (Jones et al., 2006). The tendency to make extreme personal attributions has been found to be more common in patients with bipolar disorder (who are vulnerable to hypomania and grandiose ideation) than in healthy controls (Jones et al., 2006).

An individual may reach for an internal personal appraisal of their unusual experience because of an image they hold of an aspirational “imminent possible self” (Mansell et al., 2007, p. 523). For example, individuals who are vulnerable to mania exhibit higher levels of aspirations for fame, wealth and political influence (Johnson & Carver, 2006), and the greater the extent to which patients with bipolar disorder value and perceive themselves as dynamic, creative and successful, the more likely they are to relapse into hypomania or mania (Lam, Wright, & Sham, 2005). Similarly, hypomania scores in students have been found to predict their expectations of academic and career success (Meyer & Krumm-Merabt, 2003). Drawing on studies of clinical mania (e.g., Meyer, Johnson & Carver, 1999) these findings may be interpreted as evidence of heightened responsiveness of the behavioural activation systems in individuals. Additionally, thinking in terms of the DAD model discussed earlier, if an individual has a strongly positive ideal self, then any attempt to reduce the discrepancies between this and the actual self should lead to the adoption of positive self-representations. Hence, a positive imminent or ideal self may act as a risk factor for GDs.

Mansell et al.’s (2007) ascent behaviour construct helps to explain how these initial ideas may escalate into full-blown GDs. Ascent behaviours aim to either enhance or control anomalous internal states, such as feeling unusually alert or active. Mansell and colleagues list a number of possible ascent behaviours including “extended wakefulness; increased rate of activity; generating multiple ideas and goals, the seeking of social stimulation; and the dismissing of others’ attempts to moderate behavioural changes” (p. 523). They give an example of the latter behaviour in the case of individual who appraises his racing thoughts as a manifestation of his superior intelligence, and who subsequently dominates social interactions and ignores negative feedback from others. This particular ascent behavior, ignoring negative feedback from others, has been further examined in relation to bipolar disorder by Mansell and Lam (2006) who reported that individuals with current symptoms of bipolar disorder were less likely than remitted participants to use advice from others to inform their decisions after having undergone an experimental mood elevation.
The internal state may also be amplified resulting in a GD through the process of goal-setting and the impact of goal-attainment. Again, there are at present no studies that pertain directly to GDs, but a number of suggestive findings come from studies of bipolar mania. Individuals with a history of mania have a tendency to set themselves higher goals than control participants (Johnson, 2005a,b), and current levels of hypomania have been found to predict a greater positive affective response to achieving a goal as well as the subsequent setting of more extreme goals (Johnson, Ruggiero, & Carver, 2005). These findings are consistent with evidence that it is goal-achievement life events rather than positive events more generally that are associated with increased manic symptoms (Johnson et al., 2000). This is interesting in the light of Lake’s (2008) case examples which describe the emergence of grandiose beliefs about achievements in particular fields of personal expertise.

Another candidate for the initial anomalous triggering experience might be the perception of unexpected, unsolicited or undue attention from others. If other people are experienced as paying more attention to the individual than usual (perhaps leading to comorbid delusions of reference), impaired theory of mind (ToM) may lead an individual to explain this behaviour by inferring that it must be because s/he is special and worthy of this additional attention. ToM performance in the context of persecutory delusions has been the subject of extensive empirical research (see Freeman, 2007, for a review), but GDs have not been considered in the same way. ToM has, however, been studied in the context of bipolar mania. Kerr, Dunbar, and Bentall (2003) found that ToM was impaired in currently manic patients as well as bipolar depressed patients, but not in a remitted group. It remains unclear whether ToM becomes impaired as a result of a manic mood state, or whether ToM deficits are a risk factor for mania and hence perhaps for GDs.

Not only may individuals with GDs misinterpret the interest and attention of others, but they may also react more strongly to such perceived attention. Evidence from studies of patients with bipolar affective disorder reveals increased neural activity in response to human smiles in brain areas associated with positive affect and reward (Rolls, 2000). Chen, Lennox, Jacob, Calder, Lupson, Bisbrow-Chippendale et al. (2006) report evidence of abnormal brain activation in patients in manic and depressed states of bipolar disorder in response to mood incongruent affective stimuli. Manic patients were found to have abnormal neural activation in response to images of sad faces, and interestingly they showed a differentiated pattern of neural activation to implicit and explicit presentations of sad face, unlike the unipolar and bipolar depressed patients. Specifically, Chen et al. found that a number of areas were underactivated by explicit processing of sad faces but overactivated by implicit processing of these faces in the currently manic patients. These were the amygdala, insula, and superior and middle temporal gyrus (involved in emotional arousal and perception), and the hippocampus, dorsal anterior cingulate and medial superior frontal gyrus (involved in emotional regulation and sensitivity to affect incongruency). This pattern is consistent with the finding that bipolar patients in a manic episode are worse at identifying negative facial affect (Lemble & Ketter, 2002). This may be one way in which GDs are maintained, through the failure to consciously process incongruent emotional states in others. Given the apparent failure of individuals with mania to attend to negative social feedback, it would be particularly interesting to replicate this study to examine whether there are differences in the implicit and explicit processing of disapproving faces in individuals with GDs.

### 7. Cognitive styles and grandiose delusions

#### 7.1. Jumping to conclusions bias

Freeman (2007) asserts that if delusions are incorrect/uncorrected beliefs, then we must understand the reasoning processes involved in the formation and maintenance of these false beliefs. The presence of reasoning biases such as ‘jumping to conclusions’ (JTC) is well documented in association with delusional beliefs in general (see Garety & Freeman, 1999), although to date, no studies have investigated this bias in relation to GDs in particular. Previous research has tended to combine patients with GDs and patients with persecutory delusions (PDs) into a mixed delusional group for comparison with a non-delusional control group (e.g., Dudley, John, Young, & Over, 1997) and analysis by type of delusion is unfortunately often prevented by the small sample sizes. However, the majority of research into decision-making processes and delusions has explored purely cognitive mechanisms without considering the impact of emotion. Mansell and Lam (2006) found that individuals with bipolar disorder showed impaired decision-making (characterized by failure to utilize social feedback) in an induced elevated mood state, but there has been almost no research into how positive affect might influence cognitive biases and decision-making.

#### 7.2. Attributional style

In addition to the reasoning processes discussed above, it has been suggested that GDs may be associated with a self-serving attributional style, according to which individuals tend to make more internal attributions for positive events (Freeman et al., 1998). However, research on the specific relationship between attributional style and GDs in isolation from other types of delusional belief is very limited. This may be partly due to the significant comorbidity between GDs and PDs and the tendency for researchers to recruit mixed groups of patients for comparison with a healthy control group (e.g., Fear, Sharp, & Healy, 1996; Sharp, Fear, & Healey, 1997). Jolley et al. (2006) have come closest to a specific investigation of attributional style in GDs in their study of 71 patients with a diagnosis of non-affective psychoses. They predicted that patients with persecutory beliefs would form grandiose and depressed subgroups displaying self-serving and depressive attributional styles, respectively. Jolley and colleagues found that higher levels of grandiose beliefs were associated with a greater self-serving attributional bias, but they failed to apply a Bonferroni correction for the number of correlations calculated. The only other specific association with grandiose beliefs was detected in a small subsample of patients (N = 16) who showed an externalizing bias for negative events. In this group, there was a correlation between the extent to which people made external attributions of negative events and the severity of their grandiose beliefs.

There has also been a lack of research into how elevated mood affects attributional style, and whether elation enhances the self-serving bias. However, one study has examined how goal attainment affects attributional style (Stern & Berenberg, 1979). Students who scored highly on a measure of hypomania were more likely to attribute their apparent success to internal factors. After an initial success, students also exaggerated their likelihood of correctly guessing the outcome of a coin toss. Attributional style may be therefore be affected by goal attainment in the context of GDs.

#### 7.3. Modality of thought

Given the key role of positive affect in GDs, factors that amplify positive emotion are likely to play a role in the escalation of mood and grandiosity as well as in the maintenance of GDs. The role of ascent behaviors has already been discussed, and one further factor is the modality of thought used. Holmes and Mathews (2005) have argued that emotional processing in the brain is particularly sensitive to visual mental imagery — more so than to verbal thought. They suggest that imagery susceptibility (the tendency to be a “visualizer” rather than a “verbalizer”) may be a neglected risk factor for psychiatric disorders due to the amplifying effect of imagery on emotion and several authors have shown that visual mental imagery has a greater
amplifying effect on positive affect than verbal thought (e.g., Holmes, Lang, & Shah, 2009).

Although no empirical studies have examined the role of mental imagery in GDs, its potential for a role in hypomania is suggestive. For example, intrusive images of positive future events are commonly observed in hypomania (Gregory, Brewin, Mansell & Donaldson, 2010), many of which involve “goal-oriented events that were interpersonal in nature, for example ‘being in charge of a project, in an all-powerful situation with people underneath me’ or ‘self as a great business man, people looking up to me’. Interestingly, depressed patients in the same study reported intrusive goal-oriented mental images of a negative emotional valence. This suggests that GDs might arise from depressive mood states if self-esteem shifts and the content of mental imagery changes. This proposal is consistent with the finding that self-esteem in bipolar patients is unstable compared to healthy controls and patients with unipolar depression (Knowles, Tai, Jones, Highfield, Morriss and Bentall, 2007).

The tendency to use mental imagery may interact with the goal-setting and achievement patterns characteristic of individuals who are susceptible to paranoia and which may play a role in the development of GDs. If goals are simulated as mental images then this could stimulate mood elevation according to the imagery-as-amplifier hypothesis (Holmes & Mathews, 2010). The “pre-experiencing” of the future via imagining positive goal attainment could amplify mood and contribute to the development of GDs. This tendency to pre-experience goals or behaviours may help to explain the high level of conviction with which GDs are typically held (Appelbaum et al., 1999): given the commonalities in neural activation between perception and mental imagery, the representation of GDs in imagery may enhance people’s judgments of their truth value.

7.4. Thinking about thinking

The apparent role of mental imagery in the amplification of emotion means that it is important to consider the role of the both the modality and method of thinking in relation to GDs. A distinction is made between rumination and reflection as cognitive processing strategies. Ruminations describe a repetitive focus on the content, causes and consequences of events (Gruber et al., 2009). It often involves taking a first-person perspective, resulting in the experience of being immersed in mental events (Kross, Ayduk, & Mischel, 2005). In contrast, reflection has a cognitive distancing effect as events are viewed more objectively from a third-person perspective. In PTSD, first-person perspective memories are associated with greater levels of affect than are third-person memories (McIsaac & Eich, 2004), and when asked to recall a happy autobiographical memory, both patients with bipolar disorder and healthy controls show greater positive affect, positive thoughts and faster heart rates when they are instructed to think about the memory in a ruminative manner as opposed to a reflective manner (Gruber et al., 2009). Although rumination is more commonly associated with verbal thought than with mental imagery (McLaughlin, Borkovec, & Sibrova, 2007), individuals who have a tendency to think ruminatively using first-person imagery may be at greater risk for the development of GDs. Furthermore, the finding that ruminating about past events often leads to rumination about future events (McLaughlin et al., 2007) may be linked to the future- and goal-oriented thinking often found in mania.

In addition to cognitive style, meta-cognitive style may also play a role in the development and maintenance of GDs. Although studies of meta-cognition and grandiosity have not been conducted in clinical samples, one analogue study has examined grandiose ideation in the general population. Laroi and Van der Linden (2005) found that cognitive self-consciousness (the tendency to focus attention on and monitor one’s own thinking) predicted levels of grandiose ideation. Interestingly, other forms of metacognitive beliefs were the best predictors for proneness to all other types of delusion-like beliefs. The authors concluded that this could be interpreted to mean that “the presence of such intrusive thoughts and beliefs (i.e. having grandiose ideas) may not be incompatible with the subject’s metacognitive beliefs (therefore not creating an aversive state of arousal). Indeed, the presence of such experiences may even lead to a state of positive affectivity” (p. 1437). In this way, people experiencing GDs may not only appraise internal state changes by inferring extreme personal meaning (Mansell et al., 2007), but they may do so by thinking in a modality that amplifies affect (imagery), in a manner that amplifies affect (1st person rumination), with more positive content (future-oriented goal-directed thoughts), and they may also be more consciously aware of such thoughts when they occur.

8. The dynamic nature of grandiose delusions

One factor that has been overlooked in much of the research into delusional beliefs is their dynamic nature. Appelbaum, Robbins, and Vesselinov (2004) studied the stability of patients’ delusions over the course of a year in a mixed group of 405 delusional patients by interviewing them every 10 weeks. Although they did not report data on GDs in particular, a number of findings are of interest. They reported that only 15% of patients were delusional at every follow-up interview. Furthermore, there was only a 61% chance that a patient’s primary delusion type would remain the same between any two interviews. Appelbaum et al. concluded that “[d]elusions appear to be more dynamic and fluid over relatively short periods of time than has been suggested by many classic descriptions and contemporary formulations” (p. 323). One underlying cause for both the primary type of delusion and whether an individual endorses a delusion at all might be the instability of a number of cognitive and affective states, such as the fluctuation in paranoia that results from fluctuations in self-esteem for example (e.g., Thewissen, Myin-Germeys, Bentall, de Graaf, Vollebergh and Van Os, 2007; Thewissen, Bentall, Lecomte, van Os, & Myin-Germeys, 2008).

Integrating the instability of delusional beliefs and the association of unstable self-esteem with paranoia, we might hypothesize that not only are GDs unstable, but they are so due to instability in self-esteem or social rank. There is already evidence that patients with bipolar disorder (diagnostic category most strongly associated with GDs) have greater day-to-day fluctuations in self-esteem than both healthy controls and patients with unipolar depression (Knowles et al., 2007). This hypothesis remains in need of testing more specifically in groups of patients with GDs, and we suggest that ESM would be an appropriate methodology. We would expect GDs to be associated with momentary positive fluctuations in self-esteem and social rank. As discussed above, these may not be global fluctuations in self-esteem but may instead be specific to a particular “island” of self-worth, such as one’s skill as an entrepreneur or prowess at football for instance. These fluctuations in self-esteem may also influence cognitive processes like the JTC bias. We would predict that negative fluctuations in mood and/or self-esteem would be associated firstly with a reduction in the degree of conviction in the GDs, and that further falls in mood/self-esteem might be associated with the development of persecutory delusions.

9. Developing a model of grandiose delusions

The factors discussed above may be configured into a tentative model of the development and maintenance of GDs. Various empirical findings have indicated that persecutory and grandiose delusions are the result of distinct yet related psychological processes but at the moment there is insufficient evidence to determine whether GDs differ from other types of delusional beliefs with respect to key aetiological and maintaining factors and processes. And so, while this
tentative model may be adaptable to other classes of delusional beliefs, it has been configured specifically with GDs in mind. We would expect the content, direction and valence of attributional biases, mental images, life events, internal state changes and self-esteem fluctuations to vary between different types of delusion, although the over-arching framework might still apply. It is clear from the evidence discussed above that discrepancies between implicit and explicit psychological states are common, and contemporary theories of affect (e.g., Cacioppo & Berntson, 1994; Watson & Tellegen, 1985) allow for the simultaneous occurrence of contrasting emotional experiences. The proposed model is principally concerned with the explicit versions of affect and cognition that are overtly accessible and amenable to self-report.

The balance of the current evidence is slanted in favour of an emotion-consistent account of GDs, although there is some evidence consistent with a DAD model (Beck & Rector, 2005; Rhodes & Jakes, 2000), and both routes are therefore reflected in the model. We propose that the research to-date has been overly focused on trying to determine whether either an emotion-consistent or a delusion-as-defense account of delusional beliefs is ‘true’. In fact, these may not be mutually exclusive mechanisms or pathways, and indeed they might each imply the other’s internal logic. What we present in Fig. 1 is an attempt to integrate the two theoretical accounts of the development of GDs in such a way as to illustrate the potential interplay between the routes as well as being amenable to empirical testing.

A person who is experiencing low mood, low self-esteem/social rank is likely to be motivated to modify these feelings and may therefore be primed to detect any sign or evidence of change/improvement. They may detect an externally generated ‘chink of light’ in the form of a positive event or an internal state change (e.g., achieving a goal, physiological/cognitive changes due to drug use or fatigue) which they seek to make sense of in dispositional terms, their internal positive attributions being influenced by earlier life events or cultural factors, or perhaps by their desire to feel better and motivation to seize opportunities to modify their negative mood. In this way, the process might be both emotion-consistent (the initial grandiose thought is congruent with an initial positive change in mood) and defensive (occurring within a broader context of negative affect and self-esteem that the individual is motivated to change). The initial grandiose thought might then develop into a full-blown GD by the operation of cognitive biases, the failure to process social feedback, and possible ToM impairments. Throughout this phase, a number of factors are likely to play a role in the further amplification of positive affect and the internal state change, including the use of ruminative first-person mental imagery relating to future goal attainment.

From a DAD perspective, grandiose thoughts are proposed to arise as a deliberate defense against a perceived decrease in mood, self-esteem or social rank. The precise mechanisms underlying such a process remain unclear, but may involve ruminating on past achievements or on autobiographical memories of episodes when self-esteem or social rank were more positive (perhaps again using a mental imagery modality), leading to small improvements in mood and self-esteem and internal state changes which may then be appraised in positive dispositional terms, initiating the same mood-
congruent process as described above. In this way, the two supposedly contrasting pathways into grandiosity may in fact operate alongside each other, feeding into each other rather than being mutually exclusive. Clearly, not everyone who makes internal attributions for their positive internal state changes develops GDs so this is a necessary but not sufficient part of the process of onset, and a complex interplay of situational, cognitive and affective factors contributes to the emergence of GDs in a vulnerable individual.

The model allows for two ways in which persecutory ideation may relate to GDs, centring around unstable self-esteem and social rank. As a result of negative fluctuations in self-esteem and/or social rank, individuals may believe that a facet of their (grandiose) worth is coveted by others, resulting in secondary persecutory delusions (PDs). Conversely, GDs may also emerge from existing PDs, since positive fluctuations in self-esteem or social rank may encourage the appraisal that the negative intentions of others towards them are due to the fact that they have a special talent/value/wealth that others wish to steal. It is clear that at present, due to a lack of empirical studies in this area, this model is tentative and in need of extensive empirical testing. However, we believe that it offers a fruitful range of hypotheses that researchers may wish to explore. A number of hypotheses can be derived from this model, but just three specific examples are given here. First, this model would predict that internal state changes precede the onset of GDs. This could be tested using Experience Sampling Methodologies (ESM: Hurlburt & Heavey, 2006) to examine the affective and cognitive precursors to grandiose beliefs, as well as the role of appraisals and attributional style. The model also predicts that the relationship between GDs and persecutory delusions may be mediated by unstable self-esteem. ESM could be used to examine whether fluctuations in self-esteem precede the transition between GDs and persecutory delusions. A third hypothesis derived from the model is that the development and maintenance of GDs would be associated with impaired ToM, which could be tested by comparing the performance of GD, non-GD delusional and control groups on standard ToM measures.

10. Implications for treatment

GDs present a particular problem for psychological intervention, predicting poor clinical outcome up to ten years later (Thara & Eaton, 1996) as well as being negatively associated with medication compliance (Appelbaum & Gutheil, 1980). Cognitive Behavioural Therapy (CBT) has been found to be effective in ameliorating the difficulties associated with schizophrenia-spectrum disorders (Turkington, Dudley, Warman, & Beck, 2004), but the results for bipolar disorder are less encouraging (Scott, Paykel, Morriss, Bentall, Kinderman, Johnson et al., 2006; Lam, 2006). A number of factors have been suggested to account for the somewhat disappointing evidence for the effectiveness of CBT for bipolar disorder (such as the number of previous episodes, Scott, Chant, et al., 2006; Scott, Paykel, et al., 2006), but the prevalence of GDs may be an additional consideration. Although CBT is effective for treating the positive symptoms of psychosis (Zimmerman, Favrod, Trieu, & Pomini, 2005), little work has focused on specific psychotic experiences. In one of the few such studies, persecutory delusions and unusual thought content but not grandiosity were highlighted as being most reduced following CBT interventions (Kuipers et al., 1997). Indeed, little is known about the specific application of CBT to GDs.

CBT appears to be less effective at preventing manic episodes than at preventing depressive relapse in bipolar disorder (Lam, Hayward, Watkins, Wright, & Sham, 2005), and the sense of a “hyperpositive self” – the belief that one is creative, dynamic or entertaining for example – predicts a worse response to cognitive therapy in patients diagnosed with bipolar disorder (Lam, Wright, & Sham, 2005). Furthermore, given that GDs are associated with greater conviction than many other forms of delusions (Appelbaum et al., 1999), the initial success of cognitive approaches to modifying the belief and engaging the patient in certain behavioural strategies such as reality testing may be limited. Early collaboration and working towards a shared understanding are crucial to successful therapeutic outcomes in CBT (Gilbert & Leahy, 2007) and such therapeutic factors are thus perhaps even more salient when working with GDs, as is the consideration of the emotional valence of these beliefs. GDs are typically associated with positive explicit affect and positive self-beliefs (e.g., Smith et al., 2006) which may hinder the development of a shared rationale for a therapeutic intervention.

Based on the model proposed in Fig. 1 we might expect a number of cognitive and behavioural strategies to be of use in addressing the difficulties associated with GDs. The proposed role for adverse early life events in the evolution of GDs suggests that trauma-focused interventions should be considered. This therapeutic approach would also be expected to have an impact on self-esteem, mood and coping styles which may also moderate the role played by GDs in an individual’s presentation. These therapeutic targets need not just be addressed as part of trauma-focused work, but may also constitute individually tailored, discrete interventions. If there is a role for ToM impairments to lead to mistaken attributions of others’ intentions, then we might expect patients to benefit from interventions which specifically target this domain, as used successfully in other populations (e.g., Ashcroft, Jervis, & Roberts, 1999). Although current evidence is limited, other cognitive biases that may be implicated in GDs (such as attributional style and the JTC bias) might be amenable to the application of CBT techniques.

According to the model, attributional patterns to account for internal state changes may be involved in the development of GDs which may emerge as overly positive and personal explanations for these affective, cognitive and physiological experiences. Therefore by applying cognitive restructuring approaches to these unhelpful appraisals of mood-related phenomena, we might expect patients to be able to work towards the ability to generate more balanced explanations for these experiences. This in turn should lead to a reduction in the striving and excessively goal-oriented ascertainment that are typically associated with manic episodes. The identification and recognition of early warning signs has been shown to be a valuable component of psychological interventions aimed at preventing the onset and relapse of both psychosis (Spencer, Birchwood, & McGovern, 2001) and bipolar disorder (Perry, Tarrier, Morriss, McCarthy, & Limp, 1999). We would therefore anticipate that similar approaches to the identification of early warning signs or relapse signatures alongside the development of ‘staying well plans’ (Gumley & Schwannauer, 2006) might also be effective in managing the impact of GDs.

The importance of social feedback and reinforcement in regulating beliefs is acknowledged (Bandura, 1986) but if people are socially isolated or purposefully withdraw from others then they are less able to benefit from the moderating effects of these interactions. Interventions which enhance people’s access to a social network might therefore be expected to be useful as an adjunct to augment the effects of individual therapy. Recent conceptualizations of mental imagery as an emotional amplifier (Holmes, Geddes, Colom, & Goodwin, 2008) suggest that harnessing that modality of thought as an additional strategy for affect regulation might also be of use. This could involve rescripting existing images or promoting the development of alternative images to initiate more adaptive cognitive and behavioural responses.

11. Future research

This review and the proposed model have generated a number of questions and hypotheses which need to be addressed by future empirical work. The need for longitudinal investigations of GDs has clearly emerged. This type of research would enable a better understanding of the onset, development and stability of GDs over time, as well as how their presentation and impact on functioning is
influenced by changes in self-esteem, mood and social rank. Longitudinal research designs would also lend themselves to answering questions about whether a delusion-as-defence or an emotion-consistent paradigm (or a combination of both) best accounts for the development and maintenance of GDs, as well as clarifying the factors governing the hypothesised relationship between persecutory and grandiose delusions.

There are also a number of important questions to be addressed using cross-sectional designs, such as whether or not there are meaningful ways of classifying or subdividing GDs, whether/when GDs tend to occur in conjunction with or in isolation from PDs, and whether the phenomenology of GDs allows clinicians and researchers to differentiate between diagnostic categories such as bipolar disorder and schizophrenia. Much work remains to be done to understand the potential role of specific cognitive biases in the aetiology and maintenance of GDs and how this might inform targeted cognitive behavioural interventions. An additional area of interest centres on the variation of the specificity of GDs, and how they might relate to real areas of achievement, esteem or ability. There seems, therefore, to be an important role for qualitative research to explore the relationship between life events and GDs and how preserved islands of self-esteem might contribute to the development of these extreme beliefs. In summary, there remains much to be done in developing our understanding of GDs, and in turn developing effective psychological interventions.

References


